

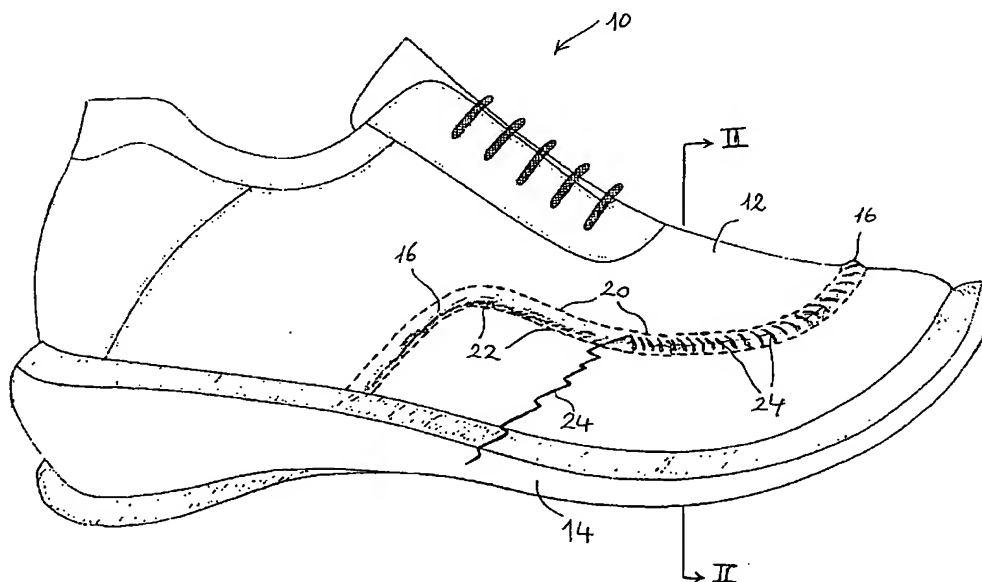
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a patent (Rule 4.17(ii)) for the following designations AE,
AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH,
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KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK,**[Continued on next page]*(54) Title: **ADJUSTABLE SHOE AND METHOD OF MANUFACTURING SAME**

(57) Abstract: A shoe (10, 23) that is adaptable to the shape of the foot includes a flexible upper (12, 32, 50) provided with a border (16, 52) and an underlying elasticized fabric or tape (18, 38) that connects portions of the upper located opposite to the border, during manufacture of the shoe the border is temporarily stabilized by a row of stitching (24, 44, 54, 64) that is easily removable after the shoe has been assembled, since the fabric or tape elastically stretches in a crosswise direction with respect to the border, the parts of the upper secured to the fabric or tape can spread so as to increase the width of the shoe.



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ADJUSTABLE SHOE AND METHOD OF MANUFACTURING SAME

DESCRIPTIONTechnical Field

This invention concerns footwear manufacture and, more specifically, the manufacture
5 of shoes that are adaptable to the shape of the foot.

Background Art

It is known that all models of footwear are produced on the basis of a form, which to a large extent determines the comfort of the fit.

Since the shape of the foot varies considerably among different people and even in the
10 same person at different times or for specific reasons (overheating, problems of circulation, local pathologies), the same model of shoe is unlikely to be perfectly comfortable for most of the wearers, who may experience a feeling of discomfort and sometimes even pain.

To overcome this problem, elasticized uppers are used, but this has obvious limitations
15 in the forms on which they can be used and thus in the types of models that can be produced.

There is also some use of footwear models equipped with one or more elastic bands joining slits made in the upper. These bands, that generally replace closing laces and zippers, have the specific function of facilitating the insertion of the foot into the shoe.
20 During assembly of the shoe, these bands have to be blocked with tapes that are then removed. This limits the use of elastic bands to those parts of the shoe that are readily accessible for the removal of the blocking tapes.

Lastly, many solutions have been suggested for producing a shoe that is adaptable to the different shapes of the feet of the wearers (see in particular EP 458881, the
25 corresponding US 5060402 patent and the other patents mentioned in them). These solutions are, however, extremely complex and therefore not readily and economically applicable on an industrial scale.

Disclosure of Invention

The object of this invention is, therefore, to provide a type of footwear that adapts to the
30 different shapes of the feet of the wearers, overcoming the limitations of the known

solutions.

In particular, the object of this invention is to provide an adaptable shoe which can be produced in a wide range of models, and which is easy and economical to manufacture.

These and other objects are achieved with a shoe in which parts of the upper, bonded by stitching or folding, are joined by elastic means.

More specifically, in a shoe made according to the invention, at least one border or joint is provided on the visible part of the upper and at least one strip of elasticized fabric or elastic tape is provided, on the inside of the shoe, joining opposite parts of the upper with respect to the border or joint.

Advantageously, borders or joints aligned substantially in the direction of the longitudinal axis of the shoe permit, by effect of the stretching of the elasticized fabric or elastic tapes, a variation of the transversal dimension of the shoe thereby achieving ideal adaptation to the shape of the foot.

Among the objects of the invention is also that of providing a method for the manufacture of a shoe which adapts to the different shapes of the feet of the wearers.

This objects is achieved with a method of manufacture consisting of arranging one or more borders or joints in the upper, temporarily stabilizing said borders or joints, applying an elasticized fabric or tape underneath said borders or joints so as to connect parts of the upper opposite them, completing the upper, assembling the shoe and removing the temporary stabilization of the borders or joints.

This temporary stabilization of the borders or joints, which can be achieved, in practice, by stitching, serves to facilitate assembly of the shoe, which would not be possible otherwise because the presence of the elasticized fabric or tape would cause distortion of the upper at the point where the borders or joints are located.

Many advantages are offered by a shoe made according to the invention. In the first place the shoe, being permanently adaptable to the shape of the foot, ensures a high degree of comfort no matter what the morphologic condition of the foot. In the second place the shoe can be made of any suitable material, such as leather, imitation leather, fabric and plastic, and in an almost unlimited number of models, the esthetics of which are practically unaffected by the alterations undergone by the upper to adapt to the foot.

Furthermore, the manufacture of the shoe is simple and does not involve substantial increases over the usual costs.

These and other advantages, along with the technical features of this invention, will be made clear by the detailed description that follows of a few examples, without
5 limitation, of its implementation.

Brief Description of Drawings

In the drawings:

- Fig. 1 illustrates a schematic side view of a first model of shoe according to the invention, in which the upper is provided with a border, in the final stage of
10 manufacture;
- Fig. 2 illustrates a cross-section according to II-II of the shoe shown in Fig. 1 after completing manufacture and in the configuration it has when not worn (that is, with the foot outside the shoe);
- Fig. 3 illustrates an enlargement of the border, circled in Fig. 2, provided in the shoe
15 upper;
- Fig. 4 illustrates the border shown in Fig. 3 temporarily fastened by stitching;
- Fig. 5 illustrates the border shown in Fig. 3 in the configuration it has when a foot is inside the shoe causing an enlargement of it;
- Fig. 6 illustrates a schematic side view in perspective of a second model of shoe
20 according to the invention, in which the upper is provided with a joint, in the final stage of manufacture;
- Fig. 7 illustrates an enlarged cross-section of the portion of the joint, marked VII in Fig. 6 and the shape it acquires when the finished shoe is not worn;
- Fig. 8 illustrates enlarged cross-section of the portion of the joint, marked VIII in
25 Fig. 6;
- Fig. 9 illustrates the joint in Fig. 7 and the shape it acquires when the finished shoe is worn by a foot that causes an enlargement of it;
- Fig. 10 illustrates enlarged cross-section of another joint fastened temporarily by a stitching, in a preferred embodiment of the invention;
- Figures 11 to 14 illustrate an plan view from above and from below of an upper in
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four sequential steps of the method of manufacture of a shoe according to the invention;

- Fig. 15 is similar to Fig. 2 and illustrates a preferred embodiment of the invention;
- Fig. 16 and 17 illustrate two variations in the method of manufacture of a shoe.

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Modes for Carrying Out the Invention

Figures 1-5 illustrate a laced model of shoe 10 produced in conformity with a first embodiment of the invention.

The shoe 10 comprises a flexible upper 12, in leather, imitation leather, fabric or other suitable material, and a sole 14. The upper 12 is provided with a border 16 obtained by folding the upper. Underneath this border 16 is an elasticized tape 18 which is fastened to the upper by two rows of stitching 20,22 located on opposite sides of the border 16 (as shown in detail in Fig. 2 and Fig. 3). Since the tape 18 is elastically yielding in a crosswise direction with respect to the border 16, the parts of the upper 12 fastened to the tape 18 can spread apart and increase the width of the shoe. Fig. 5 illustrates the conformation of the border 16 when the shoe 10 is worn on a foot that causes an increase of its width.

Advantageously, to prevent irritation to the foot, the elasticized tape 18 is placed between the upper 12 and a lining 26, also in a fabric which is elasticized at least on the area occupied by the tape 18.

Figures 6-9 illustrate a model of moccasin 30 also made according to the invention. The upper 32 of the moccasin 30 includes a vamp 34 sewn with a thread 35 to the rest of the upper 32 to form a joint 36 in which the ends are folded over each other.

Like the case described above, under the joint 36 is a tape 38 – which stretches elastically in a crosswise direction with respect to the joint – the edges of which are fastened to the upper 32, by two rows 40,42 of stitching, on the parts opposite the joint 36 (as shown in detail in Fig. 7).

As illustrated in Fig. 9, when the moccasin 30 is worn, the edges of the vamp 34 and the upper 32 fastened to the tape 38 can spread apart so that the upper widens to adapt to the anatomy of the foot.

It is obvious that different types of borders and joints, made as described above, can be

provided in the upper, lying parallel or not to the longitudinal axis of the shoe. For example, in the moccasin 30 illustrated in Fig. 6, a second joint 37 is shown in the side of the shoe. Also, under the borders or joints, several elasticized tapes can be provided.

Fig. 10 illustrates another joint 60 obtained by sewing with a thread 62 the lower facing ends of two parts 60a,60b of the upper. Another row 64 of removable stitching is also shown for the purposes indicated below. Also, in the embodiment of the invention shown in the figure, underneath the joint 60 there is a lining 66 in elasticized fabric fastened to the upper, by two rows 40',42' of stitching, on the sides opposite the joint 60.

Fig. 15 illustrates the cross section of the shoe shown in Fig. 1 produced according to the preferred embodiment of the invention described above.

For the manufacture of a shoe that is adaptable to the foot, in conformity with this invention, it is essential to stabilize the borders or joints temporarily so that the shoe can be assembled.

In particular, a first method of manufacture consists of:

- a) forming one or more borders or joints in an upper and securing them with temporary means, preferably an easily removable type of stitching made with a Strobel or similar machine: by way of example, Fig. 11 and Fig. 12 illustrate a plan view, from above and below, of an upper 50 folded to form a border 52, which has been temporarily secured by a row 54 of stitching;
- b) applying one or more elasticized tapes on the underside of the upper so as to connect parts of the upper opposite each other with respect to the borders or joints temporarily stitched: Fig. 13 and Fig. 14 show a plan view, from above and below, of the upper 50 with an elasticized tape 56 applied to the underside with two rows 58,59 of stitching along the border 52;
- c) completing the upper, by applying a lining which is elasticized at least in the zone occupied by the tapes;
- d) assembling the shoe in the usual way to obtain the model desired, with the borders or joints secured temporarily, as shown in Figures 4, 8 and 10;
- e) removing the temporary stitching; Fig. 1 and 6 show the removal of the rows 24,44 of stitching used to secure the border 16 and the joint 36 temporarily.

Fig. 16 illustrates a plan view from below of an upper 50' in a first effective variation of the method described above. In this case two elasticized tapes 56',56" are provided, sewn to a lining 68 of any kind (even in non-elasticized fabric) and applied to the upper 50' by stitching 58',59',58",59", along two borders or joints.

- 5 In a second preferred variation, illustrated in Fig. 17 (as well as in Fig. 10 and in Fig. 15), the opposite sides of the borders or joints formed in an upper 70 are connected directly by a lining 72 in an elasticized fabric fastened to the upper by two rows 74,76 of stitching.

10 The invention thus conceived may be subject to numerous modifications and variations, all falling within the scope of the inventive concept. Furthermore, all the details can be replaced with technically equivalent elements.

CLAIMS

1. Adjustable shoe, comprising a flexible upper and a sole, characterized by the fact that parts of the upper are doubled by folding or stitching and are connected by elastic means so as to adapt the upper to the shape of the foot.
- 5 2. Shoe according to claim 1, in which said parts of the upper doubled by folding or stitching are temporarily stabilized by removable fastening means which serves to permit assembly of the shoe.
3. Shoe according to claim 1, in which said parts of the upper are doubled so as to form, on the visible side, at least one border and said elastic means consist of at least
10 one portion of elasticized fabric or of at least one elasticized tape placed under said at least one border and joining parts of the upper located opposite it.
4. Shoe according to claim 1, in which said parts of the upper are coupled by at least one joint and said elastic means consist of at least one portion of elasticized fabric or at least one elasticized tape located under said at least one joint and connecting
15 portions of the upper located opposite it.
5. Shoe according to claims 3 or 4, in which said borders or joints are temporarily stabilized by a removable stitching that serves to permit assembly of the shoe.
6. Shoe according to claims 3 or 4, in which said fabric or said tape elastically stretches in a crosswise direction with respect to the border or joint above it and is fastened by
20 stitching to said portions of the upper.
7. Shoe according to one or more of the claims from 3 to 6, in which said tape is placed between the upper and a lining.
8. Shoe according to claim 7, in which said lining is elasticized at least in the zone of said tape.
- 25 9. Shoe according to one of the claims from 3 to 8, in which said borders or joints are oriented substantially in the direction of the longitudinal axis of the shoe.
10. Shoe according to one of the claims from 3 to 8, , in which said borders or joints are oriented substantially in the direction of the transversal axis of the shoe.
11. Shoe according to one of the claims from 3 to 8, in which said borders or joints are
30 oriented in the direction of both the longitudinal and transversal axis of the shoe.

12. Method for the manufacture of a shoe adaptable to the shape of the foot, characterized by the fact of comprising the steps of:

- coupling parts of the upper by folding or joining so as to form, on the visible side, one or more borders or joints;

5 - temporarily stabilizing the borders or joints with removable securing means;

- applying one or more portions of elasticized fabric or one or more elasticized tapes on the underside of the upper, parts opposite each border or joint being fasted to them by stitching;

- completing the upper and assembly of the shoe;

10 - removing the removable securing means.

13. Method according to claim 12, in which said step of temporarily stabilizing the borders or joints is done using temporary removable stitching.

14. Method according to claims 12 or 13, in which said step of completing the upper includes the step of applying an elasticized lining at least in the zone of said tapes.

15 15. Method according to claim 12, in which said portions of fabric or said tapes are elastically yielding in a crosswise direction with respect to the border or joint above.

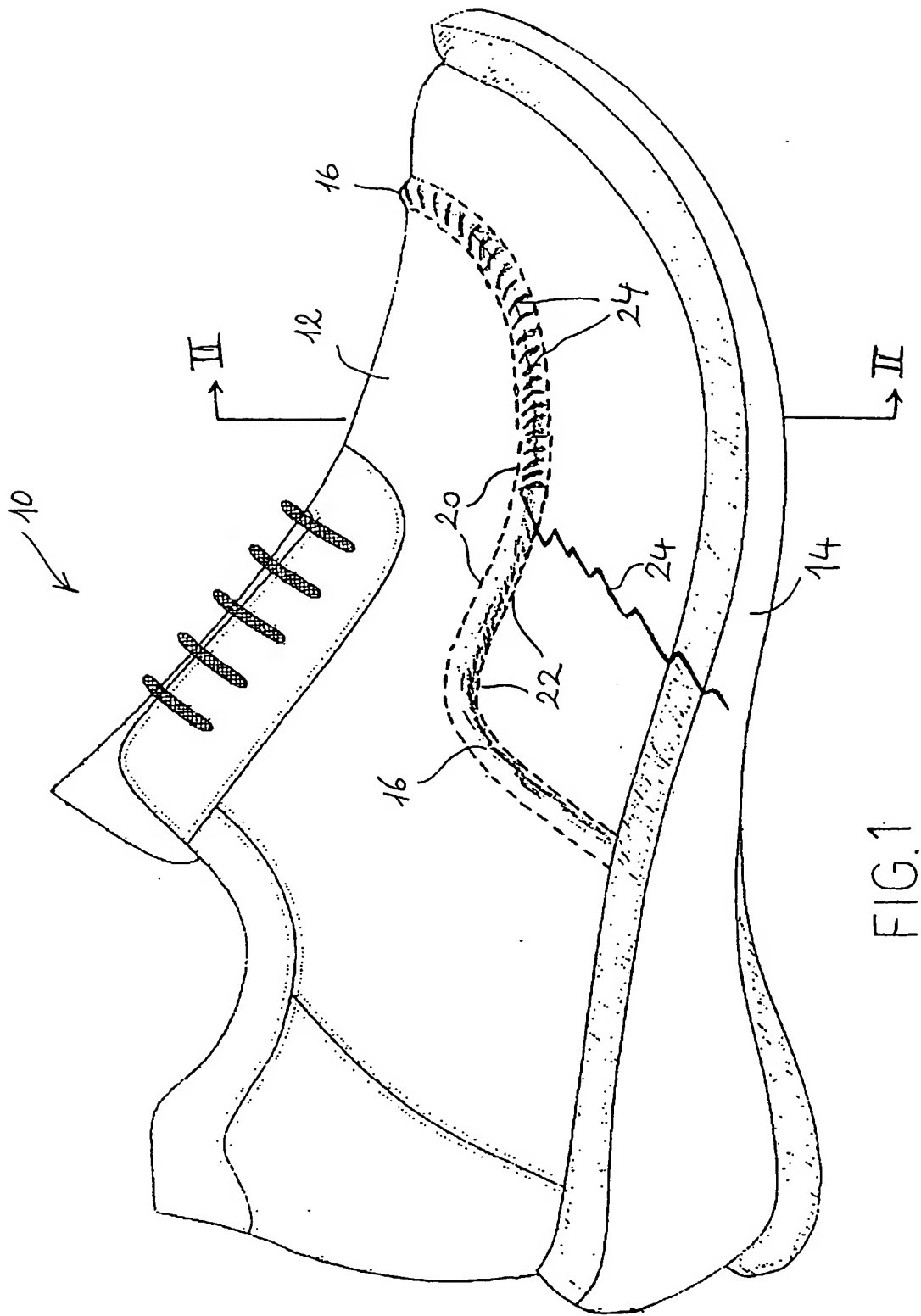
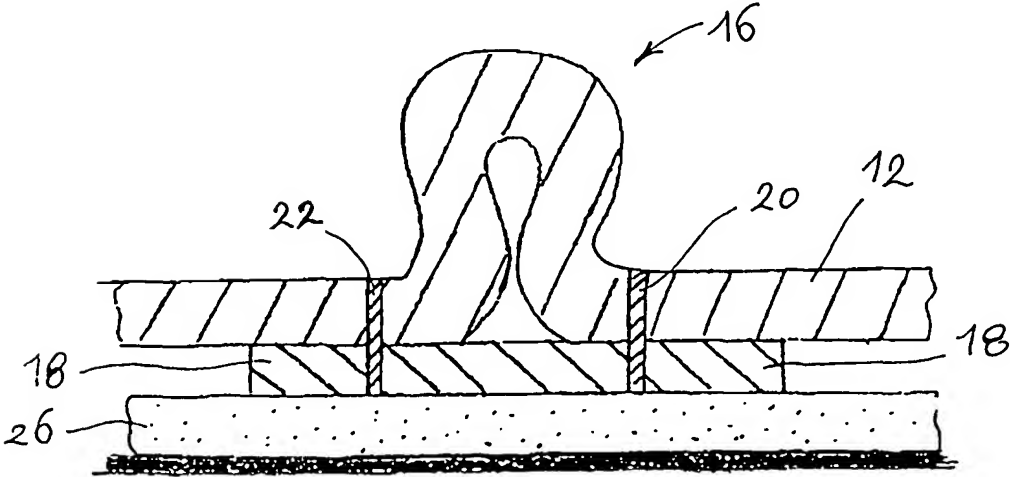
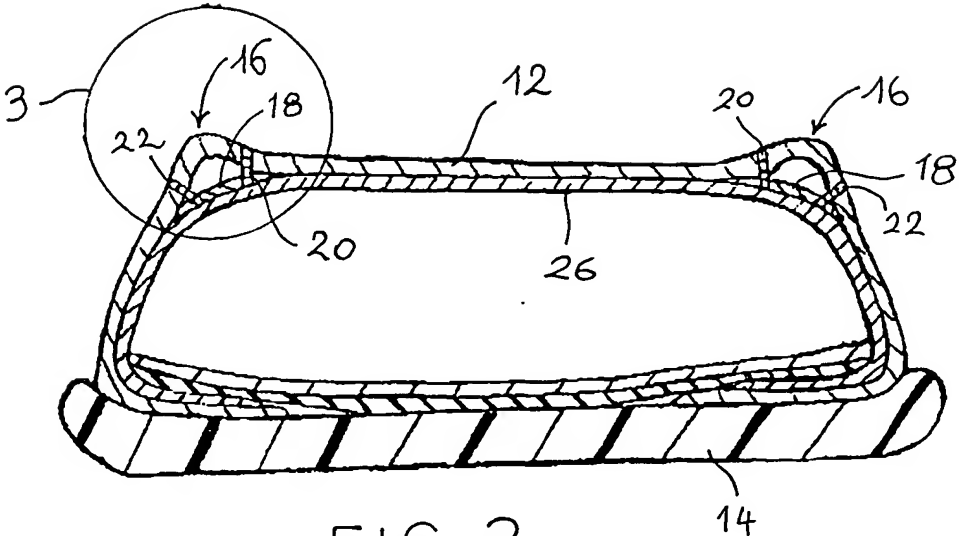


FIG. 1



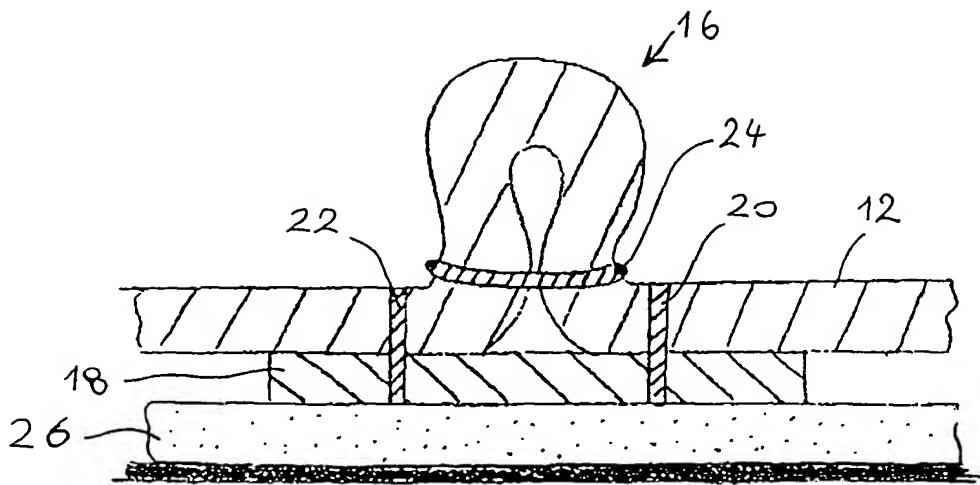


FIG. 4

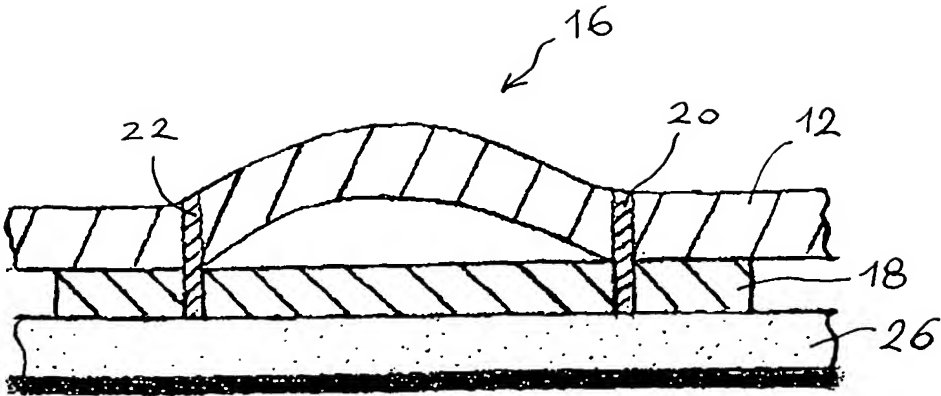


FIG. 5

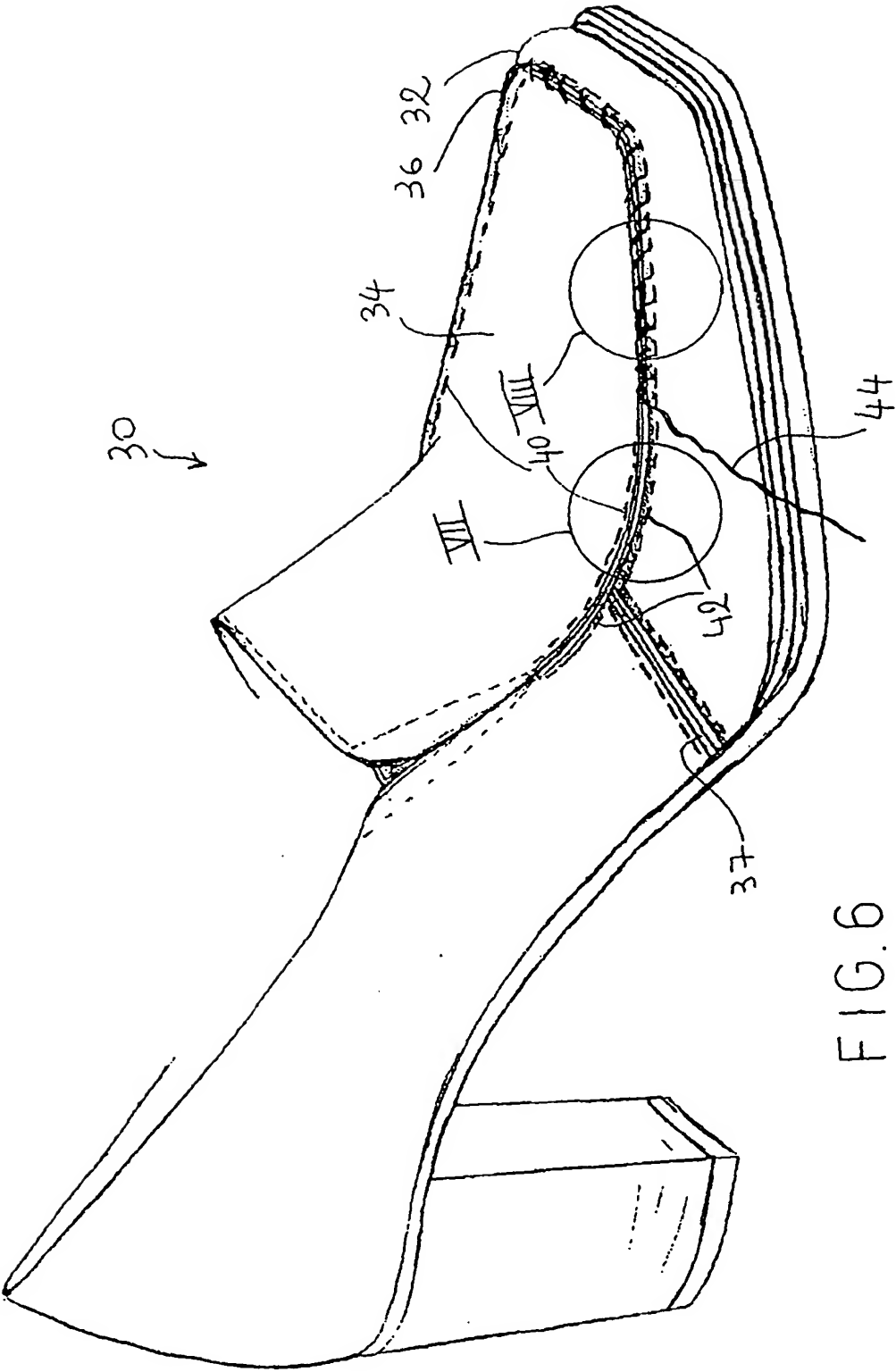


FIG. 6

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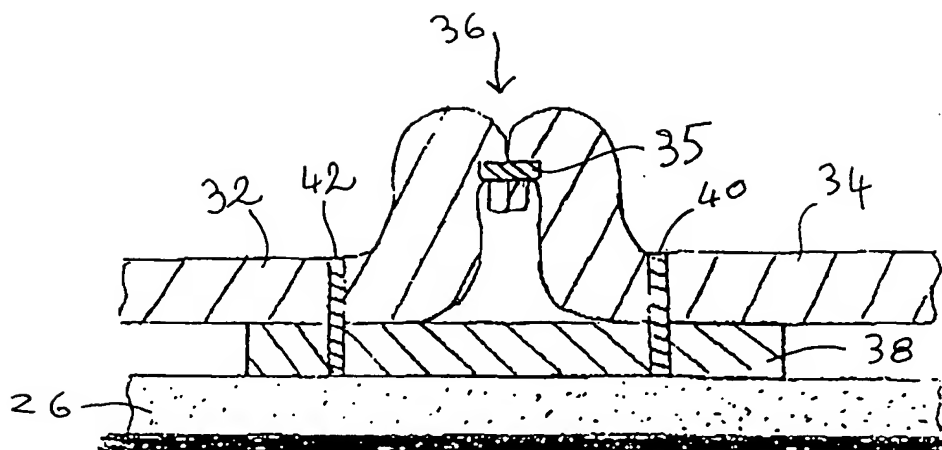


FIG. 7

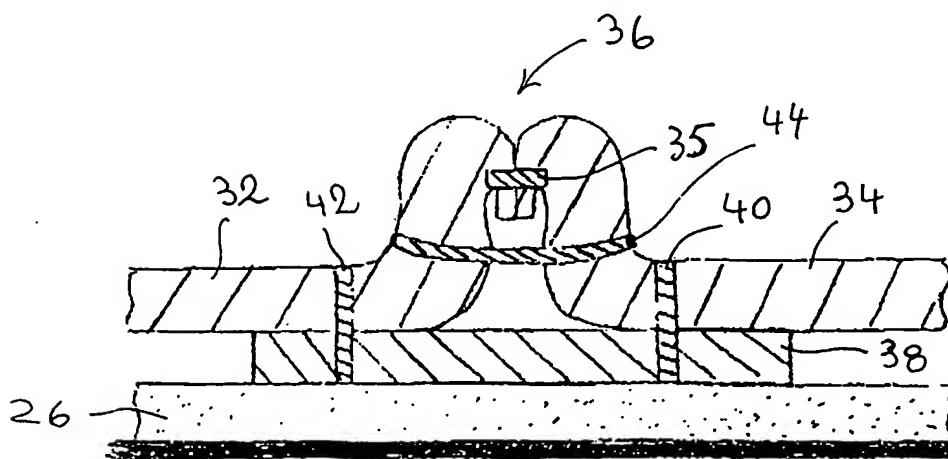


FIG. 8

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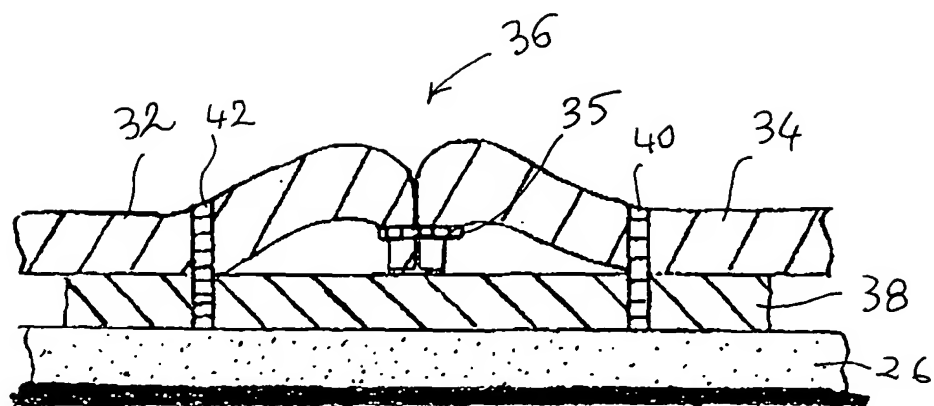


FIG. 9

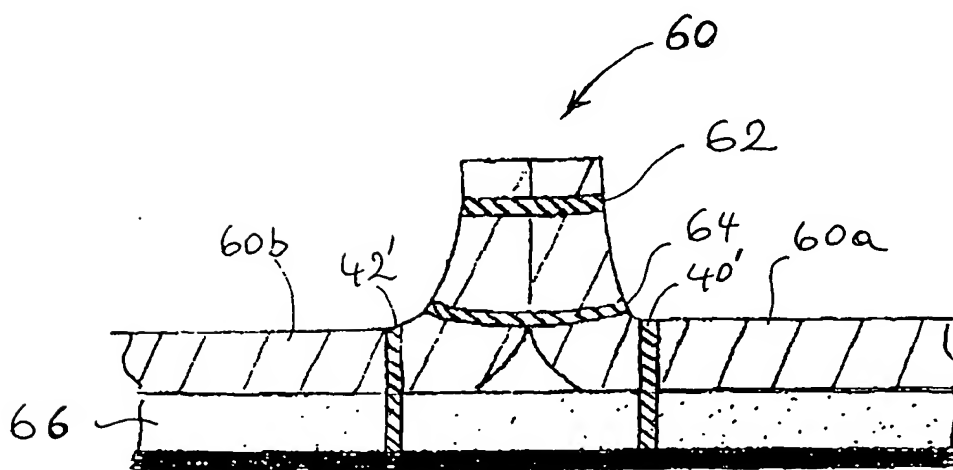
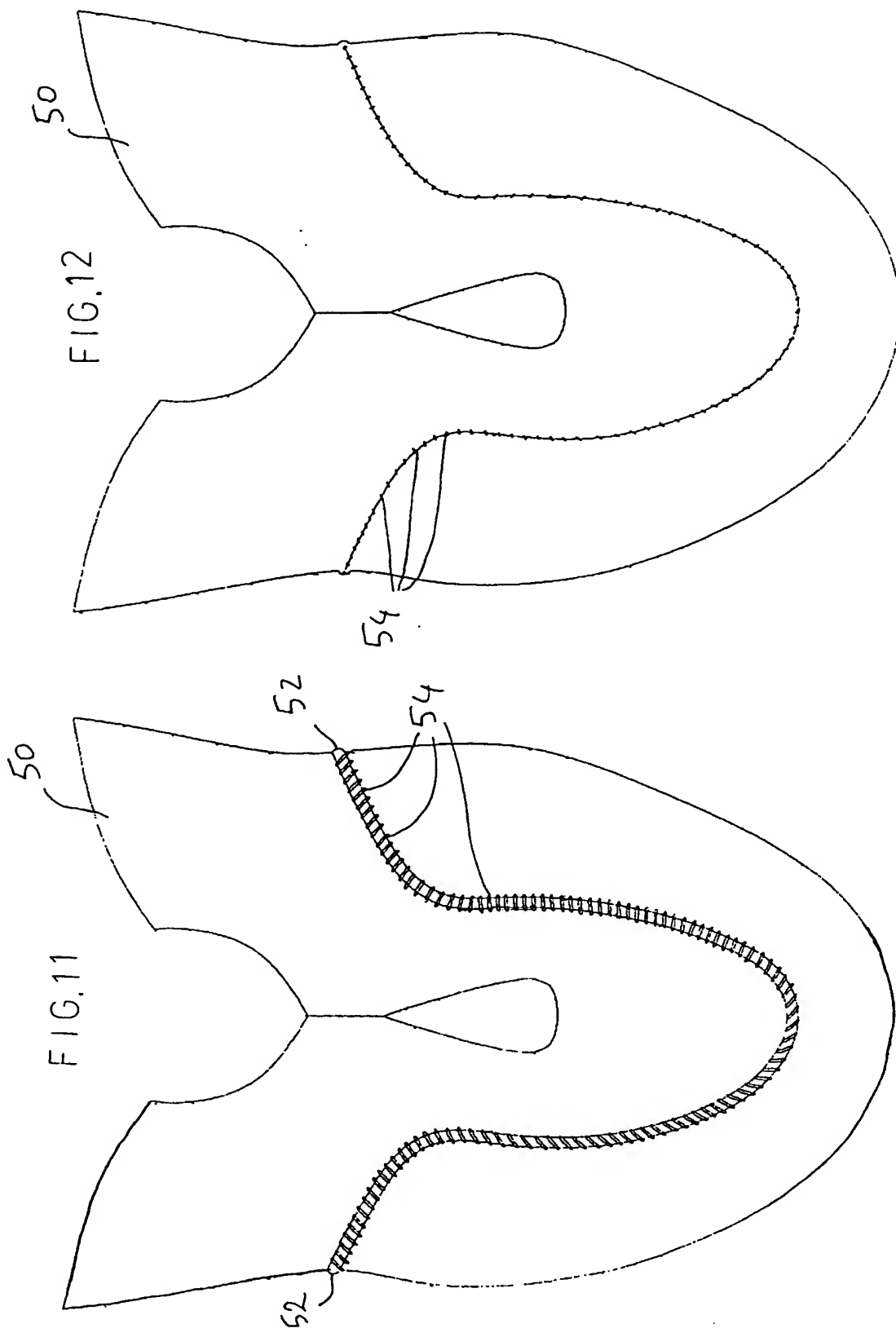
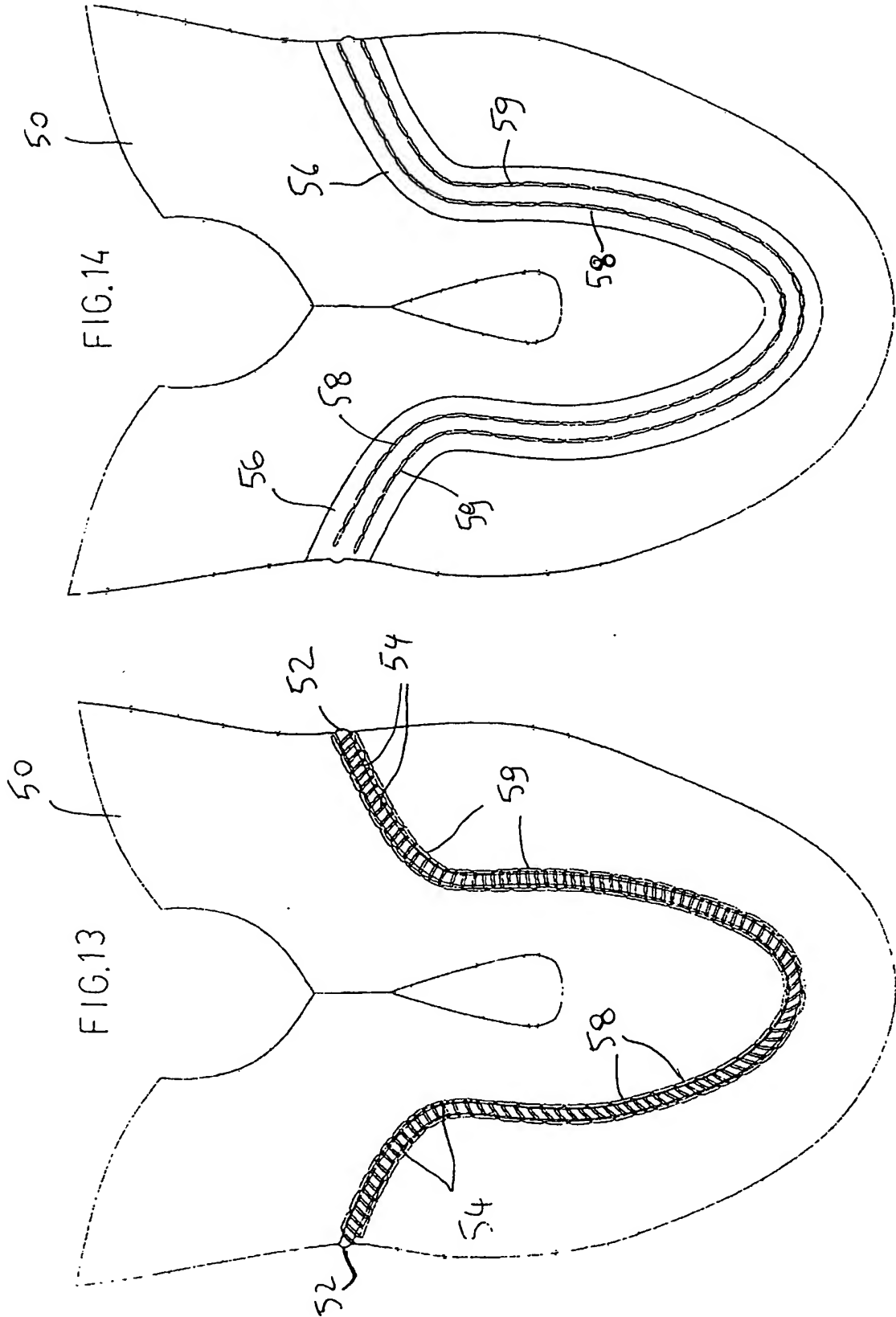


FIG. 10

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FIG. 17

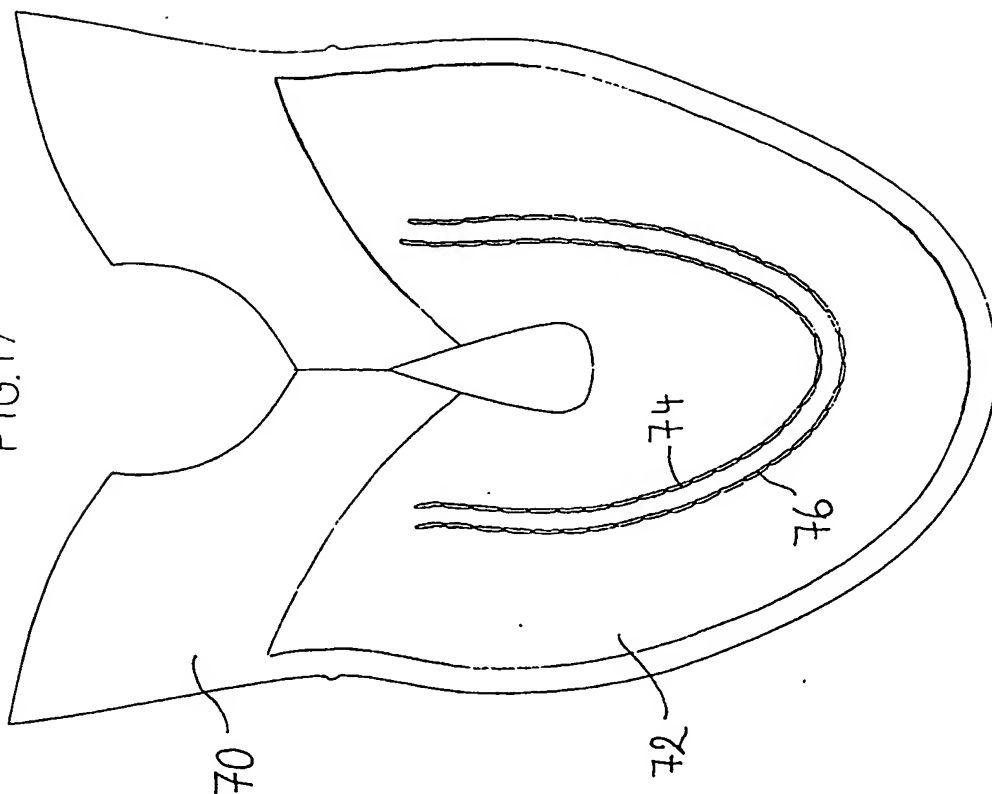
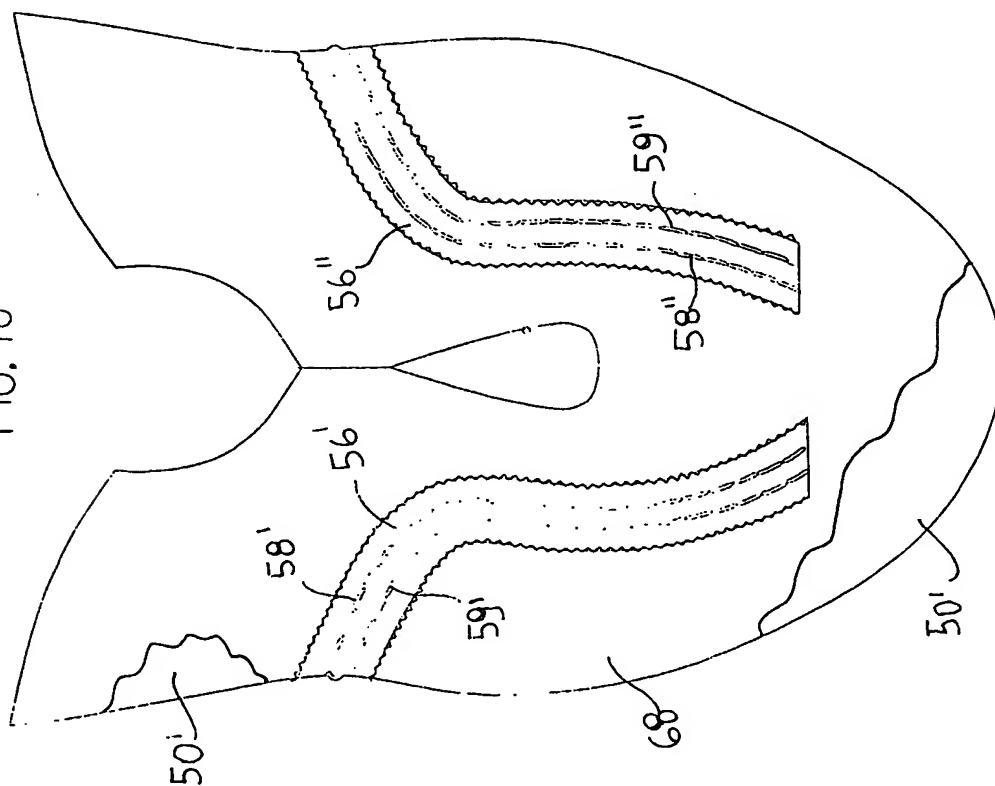


FIG. 16



INTERNATIONAL SEARCH REPORT

Inte ☐ Application No

PCT/IT 03/00003

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 A43B3/26

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 A43B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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X	WO 90 09113 A (ROSEN HENRI E) 23 August 1990 (1990-08-23) page 10; figures 4-7,15,16 ---	1-3,6, 9-12
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X	US 2 297 027 A (FRANK SBICCA) 29 September 1942 (1942-09-29) page 1, column 2, line 51-55; figure 4 ---	1,2,12
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☒ Further documents are listed in the continuation of box C.

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Date of the actual completion of the international search

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 6 279 251 B1 (DAVIS HOWARD F) 28 August 2001 (2001-08-28) the whole document -----	1,12

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/IT 03/00003

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